DRIVER

OCTOBER
1983

THE COLD WAR

DRiVER

The cold war has begun again. *No, not the kind with the secret agents, codes and electronic gadgets. We mean the kind when you have to battle bad weather to get from place to place. Sometimes, contending with winter seems like a war, complete with training, preparation and "hazardous duty." Follow along as we give you some valuable information for handling the snowy season.*

If your car's rear end skids to the right, steer to the right to straighten it out.

If it swings to the left, steer left. In a skid, pump the brakes rather than pushing the pedal in and holding it.

THE COLD WAR

Winter can be very unforgiving. It won't let you get by without some preparation. You can't just go out one morning, slap the snow tires on the car and drive off.

Well, actually you can. Lots of people do. You see them stranded by the side of the road in a snow drift, or trying to scrape three inches of ice from their windshields with a credit card, or sliding through intersections on a red light.

Those kinds of difficulties are unnecessary. A little forethought and preparation for the coming battle with snow and ice will eliminate most of the problems and make the unexpected problems manageable.

Start at the bottom with what are perhaps the most important parts of your winter driving equipment, your tires. Those who think "tires are tires" are only fooling themselves. Tires are your only connection with the road and they often make the decision of whether you will maintain that connection. It all depends on the amount of tread they have.

Tread on an automobile tire is designed to provide traction on less-than-perfect surfaces, like ice, water, snow and slush. On smooth, dry roads, a treadless tire would give better traction than one with tread. (But since you can never be sure when something will wet the roads, treadless tires are illegal.)

In winter you need all the traction you can get. You can't rely on the standard tires to do the job. Snow tires have a deeper, stronger tread for biting into snow to get you moving, stopped and turned more easily and safely.

TIRES

Buy a good set of snow tires and have them mounted on a separate set of rims for easy changing. When you remove them at the end of the winter season,

To apply tire chains to your car, untangle them and spread them out behind the drive wheels. If there are cleats, put them facing up. Attach the chains to the wheel with the spring steel chain applier.

Pull the chains up close to the wheel so they don't catch on the fenders when you move the car.

Drive forward one wheel revolution. This will carry the chains around the wheels. Then fasten the hooks, the one on the inside of the wheel first.

mark them so you'll put them on the same side of the car next winter.

Now as to the kind of tires to get, we'll offer some advice. First, if you have radial tires, it's best to get radial snow tires. This will avoid any handling difficulties that might be encountered if you had tires of different construction on the same car. Whatever you do, don't mix tires of different construction on the same *axle*. That's asking for trouble.

Tires with studs provide extra pulling power to get started on certain surfaces, like ice, so they are worth considering. Their chief problem is the fact that they damage road surfaces, and therefore some states have banned their use. If your state allows them and you decide to invest in them, be sure to use them only during the times they are legal. We have included a list of the states and Canadian provinces with their regulations on studs.

All-weather tires have become popular in the past few years. These are designed to handle well on wet and dry surfaces, as well as mud and sand. Snow tires will be better for the geographic areas with a lot of snow, but all-weather tires may be acceptable in certain areas.

Whatever snow tires you purchase should be mounted on the drive wheels, the back ones on rear-wheel drive cars and the front on front-wheel drive. Some people feel they have to buy four snow tires for their front-wheel-drive cars, but that's not really necessary, The two snow tires will be sufficient if you drive conservatively.

SERVICE

To guard the tires from prematurely wearing out, have your favorite mechanic check you car's front end alignment. Badly aligned front wheels will cause the tires to wear unevenly, resulting in an expense you don't need. With the beating the suspension will take before the winter is out, you will probably have to have the front end realigned at the end of the season.

While the car is at the shop, have any other work accomplished that you can't do yourself (or would prefer not to tackle). Pay special attention to the car's exhaust system. A leak here could release exhaust gases, including deadly carbon monoxide, into the passenger compartment. (See "The Lucky Ones" in August 1983 DRIVER for words about this gas.)

A chassis lubrication now will ease some of the stresses winter puts on the car. Now is also the time to look at brakes and replace the linings if necessary. They will also go through a lot of use during winter.

The oil is the next thing you should think about. It should be replaced and a fresh filter installed if a change is due. Even if it is not yet time for an oil change, think about this: Oil must run freely in order to lubricate and protect engine parts from rubbing on each other. The colder the outside temperature, the thicker will be the engine oil and the less protection it will provide when the engine first starts.

That is the reason for the thinner oils and the multi-grade oils on the market. Change to one of these to give your car the needed protection in cold weather. We have provided a chart which shows the proper oil, based on how cold your area gets.

Now is also the time to work on any other parts that require servicing. Check all the hoses and wiring under the hood and replace any that are in marginal condition. Don't forget all the various filters.

A tune-up just before the winter season is another good idea. With your car running smoothly as the snow begins, you can get through the next three or so months with less worry and hassle.

Pay special attention to the car's battery. It will be called upon to power many more accessories at the same time during the cold period than at any other season of the year. With the lights, defroster, heater, wipers and (perhaps) radio all operating, a weak battery may think twice and decide to go on a permanent vacation.

Charge the battery, if it will hold a charge, or replace it with a new one. (See the accompanying story on buying a battery.) Don't take chances; that clicking noise a dying battery makes is a frightening sound when you're the only one in the parking lot at 6 p.m. with icicles hanging from your eyebrows.

Check the coolant in your radiator. If the stuff is old, drain it out and replace it with fresh. Old coolant may still do its anti-freeze job, but the rust inhibitors may be exhausted. Always follow the instructions on the container for mixing it with water. The proper radio will give the greatest protection against freeze-ups — a vital consideration in those areas where the temperature drops far below zero.

As important as making sure the car will start and keep going is making sure you can see as you motor along. Be sure the car's wipers are working well, and that the rubber blades are in good condi-

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THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

DRIVER

DEPARTMENT OF THE AIR FORCE
HQ AIR FORCE INSPECTION
AND SAFETY CENTER
Norton Air Force Base, California
92409

AFRP 127-1 VOLUME 17 NUMBER 5
OCTOBER 1983
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PUBLISHED MONTHLY
IN COOPERATION
WITH THE
DEPARTMENT OF THE ARMY
AND THE
DEPARTMENT OF THE NAVY

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Entered as a publication at the Second-Class rate (USPS No. 586-430) at San Bernardino Postal Service, 1331 South E Street, San Bernardino, CA 92403.
SUBSCRIPTION — DRIVER is published monthly and is available for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Back issues are not available. Changes in subscription mailings should be sent to the above address. Use of funds for printing this publication has been approved by Headquarters, United States Air Force, Department of Defense, Washington, D.C. No payment can be made for manuscripts submitted for publication. Contributions are welcome, as are comments and criticism. Address all correspondence to the Editor, DRIVER Magazine, HQ AFISC/SEDD, Norton AFB, CA 92409.
Distribution: One copy for every 9 members of USAF.
ATTENTION DEPT OF THE NAVY PERSONNEL: Address all queries concerning distribution to NAVSAFECEN, NAS NORFOLK, VA 23511, Attn: Safety Publications Dept. All other correspondence will be welcomed by the Editor.
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THE EDITOR SPEAKS

DOUBLE CLUTCH

DO YOU CARE ABOUT BUMPERS?

When NHTSA lowered the bumper standard from 5-mph to 2.5-mph, most of us didn't consider it important news. A lot of drivers have strong opinions about air bags and automatic seat belts, but bumpers have never made it as a topic of lively conversation over lunch. Except around insurance companies, of course.

Insurers sued the Department of Transportation over NHTSA's downgrading of the 5-mph bumper standard. They also have filed a motion with the U.S. Court of Appeals asking that NHTSA be forced to undertake a review of new bumper crash data, should the court decide not to order an immediate return to the 5-mph standard.

Some of that new crash data has caught our attention and we think it might catch yours, too. A series of low-speed crash tests were conducted with an '84 Ford Tempo with a 5-mph bumper and an '83 Honda Accord with a 2.5 mph bumper. In a right-angle crash at 5 mph, the Tempo had $309 in damage, the Accord $916. After being backed into a pole at 5 mph, the Tempo had no damage, the Accord needed $782 in repairs. After the entire series of low-speed tests, total estimated repair costs for the Ford Tempo were $931. Repari costs for the Honda Accord were $3,655, almost four times as much.

The lowered bumper standards were expected to save money for consumers because they would cost the manufacturer less and the savings would be passed on to the buyer. Also, weight reductions were supposed to translate into gasoline savings. There is little evidence that either of these anticipated savings has amounted to much.

the cold war

continued

The person in this car might have difficulty seeing the children behind him with this much snow on the back window. Clear off all the snow and ice from the glass so you will have a 360-degree field of vision.

(USAF photo by SSgt. Alan Koester)

tion. It may be cheaper to try to get by with old blades, but if they're brittle and cracked, they won't clear off the windshield and you won't be able to see. Buy the blades now and wait until the next paycheck to buy that cassette tape or whatever.

Make sure the reservoir for the windshield washer solution is filled. On many days, the dirt deposited on your glass by slush and road spray won't come off easily without the washer fluid.

What we said about "doing it now" and "buying it now" applies to all maintenance and repairs to the automobile. Breakdowns and delays are annoying to the driver in the best of times. In winter, they can be especially dangerous, because of the cold.

CARRY-ON BAGGAGE

It is just for the possibility of such problems that we are giving a list of supplies to be carried in the car. This is only a suggested list. Anything else you want to carry is okay, as long as you don't overly weigh down the rear end, and as long as you keep the stuff from rattling around.

First is a plastic ice scraper, for the crusty buildup on the windows. Use only plastic. Metal will scratch the glass permanently. You might keep a spare scraper, in case you break one. Next is a brush, for sweeping off the snow. Keep these in the passenger compartment in easy reach.

Carry a small shovel in the trunk, for use when you get stuck and need to dig out the wheels. A folding camp shovel is great for this.

A small amount of something for traction should be included in the supplies. Sand, rock salt and kitty litter all work very well for this purpose. The latter is perhaps the best because it is lighter than the other two and it is easier to clean up. Also, it won't damage metal like salt will.

Note, we said a small amount. You don't need to sand the entire street to get your car going. Besides, a large amount of your traction agent will take up too much space.

In case you get stuck somewhere, you need road flares or reflective triangles to alert other motorists of your position and (hopefully) get them to stop to help you.

For those dreaded times when your battery gives up the ghost, include a good set of jumper cables. You can also use these to assist someone else who's stalled.

In your tool kit, have a good assortment of screwdrivers and wrenches, along with adjustable wrenches and pliers. Some silver duct tape and some medium-gauge wire will help for temporary repairs in emergencies. (Make sure these *are* temporary, though. Get that wired-on muffler properly repaired

continued

If you have friends who can push you out of the deep snow, fine. Otherwise, you will need a shovel and some sand to get the job done.

(USAF photo by Capt. Dennis Pierson)

at the earliest opportunity.) Also, carry a few spare bulbs and fuses.

Besides the jack and the spare, which you of course keep properly aired up, keep a set of tire chains in the trunk. The light snow that was falling in the morning could turn into a full blizzard by the time you leave work, and the chains might be necessary.

Chains are perhaps your greatest weapon in maintaining control during the cold war. They are not so much of a hassle as you might think; just follow the instructions with the photos in this article. Remember, the chains go on the drive wheels. They might look a little funny on the front wheels, but if your car is front-wheel-drive, they won't do much good on the rear.

Inside the car, within easy reach, you should have a good flashlight and a good first aid kit. Also, a blanket is a wise addition to the gear, in case you're stranded for some period of time. Keep it inside the car, too. It will be warmer there than it would be in the trunk.

MORNING CHORES

Often in winter, just getting started is most of the problem. It can sometimes get so cold in the night that the car simply refuses to wake up and start up. Therefore, do everything you can to make your starts as easy as possible.

Keep the car as warm as you can. If you have a garage, clean out the junk so the car can stay inside overnight. If you have a carport, get the car under it. If not, try to park close to a building for a little extra warmth. Even a car cover will help. Every little degree may make the difference between start and no-start. An electric engine block heater can be installed that will keep your engine at a reasonable starting temperature during the night. This could be especially valuable if an emergency required you to go out in the coldest part of the night. Think of it like an "electric blanket" for your car.

Do everything you can to make your morning preparations easy. You can't avoid shoveling out the car, but you can avoid a lot of the ice scraping. If you have to park outside, a car cover will eliminate much of the ice build-up and cut the time spent preparing to get the car out of the driveway. If you don't have a car cover, a tarp over the windshield will help a lot.

Keep the windows as clean as you can at all times. It is much easier to clear ice off clean windows, and the defroster will work faster to blow the moisture away on the inside if the inside is also kept clean.

When you're brushing the snow off and scraping the ice off, don't skimp. Clear it *all* away. Neglected mounds of

A brush and scraper combination like this one is your best weapon in the cold war. Make sure you use only a plastic scraper on the windows, because metal will scratch them permanently.

(USAF photo by SSgt. Dwight Williams)

snow on the roof will blow off as you drive and irritate other drivers, as well as interfere with their view of the road.

But more importantly, ice that you might leave on the glass will reduce the 360-degree field of view you need for safe driving. You wouldn't rely on just your outside mirror in summer, so don't in winter. Clear off every square inch of glass.

Remember to brush the snow away from the headlights and taillights, so you can see and be seen at all times. And clear it away from the grill in front, so the airflow can get through to the radiator. Interestingly enough, snow in front of the radiator can hold in the engine's heat, causing overheating and boilover.

To help in the ice removal, you should start the car and switch on the defroster before you begin to scrape.

With the car cleaned off and the driveway shoveled, you can move out in a warm, smoothly-running automobile to face all the other drivers out there who may not be so forward-thinking as yourself.

THE MAIN BATTLE

By this time, if you've followed the instruction we've given, you should be on the road. Now comes the hard part — staying there. That's the battle in this "cold war," you trying to maintain control while winter tries to put you in the ditch up to your mirrors in snow.

Speed is your enemy. The faster you try to move the car in any direction, the more likely you are to lose the battle.

Let's start with the start. Don't try to start too quickly. Start out very easily and gradually, giving the tires a chance to get what little traction they can on the ice. If you step hard on the gas pedal, the wheels will spin and you'll get nowhere fast. If you're one of those people who give the car more gas when it fails to move, you'll have to retrain yourself to use light pressure on the accelerator.

Speed is still the enemy as you drive. Speeds that would be reasonable in dry weather will be foolish, even dangerous, in winter. On wet or icy surfaces, you will constantly face the hazard of skidding, which we'll discuss in a moment. Keep your speed moderate, and be ready at all times for a stop or other emergency manuever.

Everything you do will take more time and space to accomplish, and a slower speed will give you ample opportunity to prepare. Plan your movements in advance, and begin to make those movements sooner.

For instance, turns. When you approach a turn, begin to slow the car earlier than you would if the streets were dry. If you come up on a turn too fast, you'll slide past the turning point.

Likewise, when you'll be stopping for a sign or light, begin the slowing process sooner. You should be careful with your brakes. That is, don't lock them up. The danger of a skid caused by locked brakes is much greater on snow and ice than it is on dry roads.

If you feel at all unsure of the surface, pump the brakes. Apply quick pressure to the brake pedal and let off and apply again. Keep this up until you get the car stopped. Use a light touch; do not stomp on the brake. If you stomp on the brake, you lock the wheels, and if you lock the wheels, you lose steering control. You can increase the pressure on the brake pedal as the car slows down and the traction increases.

SKIDS

If you lock the brakes you could skid, and a skid on a wet or icy road can be the worst kind. Actually, skids can be caused by too much speed or too violent a maneuver also. Therefore, drive as slowly and smoothly as the winter conditions indicate.

Most skids are the rear-wheel variety, where the rear end of the car moves to one side or the other. To handle these, first slow down by easing off the accelerator. Then, steer into the skid. That is, if the rear moves to the left, turn the steering wheel left, and right if the car's rear goes right.

Steer smoothly and carefully. When the car begins to straighten out, turn the wheel back to straight ahead. Be careful not to oversteer because this might cause a skid in the opposite direction or fishtailing. Don't use the brakes unless it is necessary and then just pump them.

continued

If you car sits outdoors at night, you might have a lot of digging to do to get it out. Park in a sheltered spot whenever you can.

Even when the highways are otherwise dry, ice may be hiding in shaded areas. Slow down before you drive through a shadowy part of the road to insure against skidding on this "black ice."

On front wheel drive cars, steer as we mentioned above and touch the accelerator just enough to keep the front wheels pulling the rear ones, or else take the car out of gear.

In a front wheel skid, the car will continue to go straight, no matter where the wheels are pointed. This sounds dangerous, but is easily corrected. Ease off the gas. The turned wheels will act as a brake and help slow the car. When the steering control returns, adjust the path of the automobile and continue along at a slower speed. (There's a more complete discussion of skid control in last month's issue.)

STUCK

Sooner or later, it will probably happen to everyone who drives in snowy areas — getting stuck. Deep snow or glare ice could cut the traction so much that your wheels will only spin and fail to move the car.

Don't get mad. Try "rocking" the car.

Expect trouble on icy roads. You, or others, may lose control at any time, and hazards like this jackknifed truck will make slow, careful driving a must.

STUDDED TIRE RESTRICTIONS

UNITED STATES

ALABAMA — Rubber studs permitted
ALASKA — Sept. 15 — May 1; Sept. 30 — Apr. 15 South of 60°N
ARIZONA — Oct. 1 — May 1
ARKANSAS — Nov. 15 — Apr. 15
CALIFORNIA — Nov. 1 — Apr. 1
COLORADO — No restrictions
CONNECTICUT — Nov. 15 — Apr. 1
DELAWARE — Oct. 15 — Apr. 15
DISTRICT OF COLUMBIA — Oct. 15 — Apr. 15
FLORIDA — Rubber or plastic studs permitted
GEORGIA — Not permitted except for snow and ice conditions
HAWAII — Prohibited
IDAHO — Oct. 1 — Apr. 15
ILLINOIS — Prohibited
INDIANA — Oct. 1 — May 1
IOWA — Nov. 1 — Apr. 1
KANSAS — Nov. 1 — Apr. 15
KENTUCKY — No restrictions
LOUISIANA — Prohibited
MAINE — Oct. 2 — Apr. 30
MARYLAND — Prohibited
MASSACHUSETTS — Nov. 2 — Apr. 30
MICHIGAN — Only "soft studs" permitted Nov. 15 — Apr. 1; in upper peninsula and northern lower peninsula Oct. 1 — May 1
MINNESOTA — Prohibited, but use is permitted by temporary non-residents on a reciprocal basis
MISSISSIPPI — Prohibited
MISSOURI — Nov. 1 — Mar. 31
MONTANA — Oct. 1 — May 31
NEBRASKA — Prohibited except for license plates carrying the wheelchair symbol
NEVADA — Oct. 1 — Apr. 30
NEW HAMPSHIRE — No restrictions

OIL FOR THE COLD WAR

Lowest Atmospheric Temperature Expected	Single Viscosity Oils	Multi-Viscosity Oils
32°F	20,20W	10W-30, 10W-40
0°F	20W	10W-30, 10W-40
Below 0°F	5W*	5W-20, 5W-30

*SAE 5W single-viscoxity oils should not be used for sustained high-speed driving (above 55 mph).

As if snow and ice weren't bad enough, the cold war sometimes brings on foggy conditions to make driving more tricky. Drive slow and expect another vehicle to appear out of the fog at any time.

NEW JERSEY — Nov. 15 — Apr. 1
NEW MEXICO — Permitted only in conditions that are likely to cause a vehicle to skid
NEW YORK — Oct. 16 — Apr. 30
NORTH CAROLINA — No restrictions
NORTH DAKOTA — Oct. 15 — Apr. 15
OHIO — Nov. 1 — Apr. 15
OKLAHOMA — Nov. 1 — Apr. 1
OREGON — Nov. 1 — Apr. 30
PENNSYLVANIA — Nov. 1 — Apr. 1
RHODE ISLAND — Nov. 15 — Apr. 1
SOUTH CAROLINA — Permitted if the studs do not project more than one-sixteenth of an inch when compressed
SOUTH DAKOTA — Oct. 15 — Apr. 15
TENNESSEE — Oct. 1 — Apr. 15
TEXAS — Permitted only if the studs will not damage the highways
UTAH — Only "soft studs" permitted Oct. 15 — Mar. 31
VERMONT — No restrictions
VIRGINIA — Oct. 15 — Apr. 15
WASHINGTON — Nov. 1 — Apr. 1
WEST VIRGINIA — Nov. 1 — Apr. 15
WISCONSIN — Prohibited, except for out-of-state registered vehicles passing through state, 30 days maximum
WYOMING — No restrictions

Shift from forward to reverse, each time giving a little pressure on the accelerator until the car gets going.

If this doesn't work because the ice is too slick or the snow too deep, go for the shovel and sand (or salt or kitty litter) in the trunk. Dig the snow from around the wheels with your shovel and spread a little of your traction agent around the wheels.

Try rocking the car again and carefully move out. Don't spin the wheels because this will spray the sand around and possibly dig you in more. Keep the front wheels straight when you are trying to get out of a stuck position. If they're turned, you could dig yourself farther in.

THE THAW

This particular cold war has one good aspect — it has a time limit. Come March or April, the ice and snow will thaw and friendlier conditions will follow. Until then, wait it out and drive safely.

CANADA

ALBERTA — No restrictions
BRITISH COLUMBIA — Oct. 1 — Apr. 30
MANITOBA — Oct. 1 — Apr. 30
NEW BRUNSWICK — Oct. 16 — Apr. 30
NEWFOUNDLAND — Nov. 1 — Apr. 30
NORTHWEST TERRITORIES — No restrictions
NOVA SCOTIA — Oct. 15 — Apr. 30
ONTARIO — Prohibited
PRINCE EDWARD ISLAND — Oct. 1 — May 31
QUEBEC — Permitted Oct. 15 — May 1 for vehicles weighing less than 2300 kg
SASKATCHEWAN — No restrictions
YUKON — No restrictions

(Note: These dates are taken from a release from the American Automobile Association and are current as of last winter. Check with local authorities to be sure.)

Cities can be especially hazardous in the winter. Icy driving conditions combined with thousands of motorists going in every direction can lead to an epidemic of dented fenders.

(Photo by Lt. Robert Prucha)

Besides being cold and miserable, winter brings on driving conditions that are poor at best. Arm yourself with all the weapons listed in this article for battle during the cold war.

(USAF photo by TSgt. Wayne W. Specht)

Even the best snow tires won't get you moving if you floor the accelerator when you're driving on ice. Put careful, slow pressure on the pedal.

On slick roads, allow extra space all around your car, to whatever extent you can control that space. This will give you maneuvering room in case you skid, or someone else does.

HOW TO BUY A BATTERY

If your present battery is more than four years old and showing signs of weakness, such as an engine that cranks slowly or dimming headlights, it may be time to shop for a replacement before you get stranded this winter, says the Automotive Information Council.

Winter's cold weather works to reduce battery efficiency. Ninety degrees is the temperature at which both battery and engine will perform at 100-percent efficiency. As the temperature falls, battery power is reduced and the engine requires more power to help it start. Since the heaviest demand made of a battery occurs during starting, a weak battery won't make it through a cold winter.

Batteries come in many shapes and sizes and it's important to replace your car's battery with the proper size and voltage. Battery sizes are indicated by numbers often followed by one or more letters. These codes indicate the actual battery exterior size as well as voltage and terminal position and are found on the battery's label.

Before you buy you'll also need to determine how powerful a battery your car requires. This is indicated by cold cranking amps (CCA). To determine CCA all you need is you car's engine displacement size (CID). If you don't know, check your owner's manual. A car needs a battery with at least as high a CCA rating as its engine displacement, but not less than 250 CCA. For example, a 95 CID engine requires a battery rated at no less than 250 CCA, a 400 CID engine requires a battery rated at least at 400 CCA. Remember that the climate you drive in, how you drive and vehicle equipment all influence your CCA requirements.

If you have any doubts about replacing a battery, have it checked now. It could save you a time-consuming and expensive road service call.

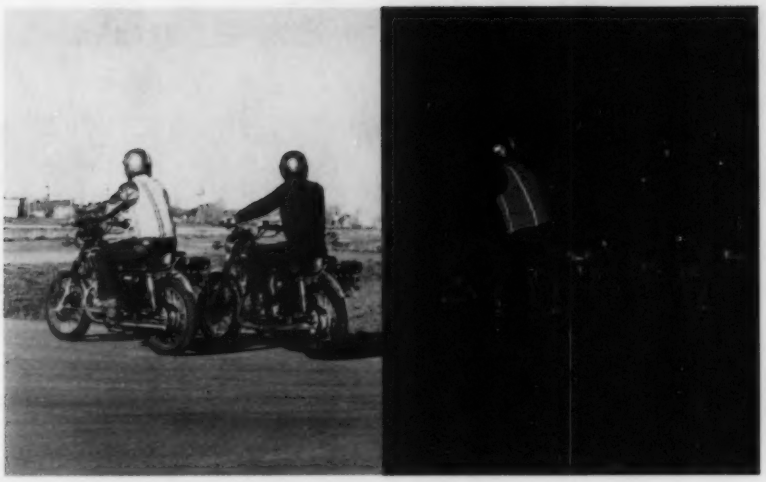
DON'T GET LOST in the dark

If you're a jogger, a bicyclist, a motorcyclist or just a non-athletic type who occasionally walks a few blocks to visit friends, your visibility is your most important asset. If drivers can see you, they're a lot less likely to run over you!

The people in these photos are wearing clothing trimmed with retro-reflective materials which contain up to 90,000 tiny glass beads per square inch. In daylight the trim looks ordinary but at night it bounces light back to the source regardless of the angle from which the light comes. Result: An image 200 times brighter than white paint.

Notice too how reflective material on two-wheelers provides visibility and identification at night even though the riders themselves may be impossible to see.

Reflective clothing and accessories are widely available in many price ranges. Until you buy some, be sure to wear white or light-colored garments when walking or riding after sundown. (Scotchlite reflective fabric from 3M Company)



do you WALK like you drive, or vice versa?

Before you answer that question, take a look around you. Are there people walking at a faster pace than the "traffic," cutting in and out to get around the flow? Are there others dashing out of doorways without due caution? How many times have you run into people walking on their left side of the hall when everybody else in on their right? And how about those who hold conferences in the middle of a crowded hall blocking traffic in all directions?

Walking, like driving, requires the "operator's" attention. Pay attention to what you're doing and you'll do it better. If your mind is on work or a personal problem or finding a better radio station, you may be headed for a close call or collision, whether you're walking or driving.

There is something you can do to improve how you pay attention: practice. That's right, practice paying attention to what you're doing. It has been proved that you can mentally practice any skill that you have personal, physical knowledge of. Professional athletes do it all the time. For example, basketball players probably spend as much time shooting free throws in their minds as they do on the court.

You can do the same thing with your driving. Practice it mentally while walking. You'll probably improve both your walking and driving skills as you do.

Walking and driving require operator attention. A lapse in concentration while doing either can lead to an "accident." You can practice paying attention and be a safer driver and walker.

READY aim XCELER 8

It's unconscionable to aim a firearm at somebody, yet every day we aim motor vehicles at others without a second thought.

In most areas it's illegal to take a firearm into an establishment that serves alcoholic beverages. But it's legal to drive to such a place and (although it's illegal above certain blood-alcohol content levels) drive away again.

Perhaps if we treated our motor vehicles as though they were loaded weapons we'd all be safer.

Time
10
Temperature
SORRY ABOUT THE AIR CONDITIONER, GUYS, BUT IT'S ON THE FRITZ! HEY THERE FELLA, WATCH THE LANGUAGE! NOW THEN, LET'S PUT THE SHOW ON THE ROAD AND GIVE A BIG HAND TO OUR FIRST SPEAKER...
Boo! Boo! IT WUZ ON THE FRITZ LAST YEAR! BOOOooo...!
WELCOME Y'ALL to the 2ⁿᵈ Annual WINTER DRIVING ARTS SEMINAR
University of SAFE
ARROYO CHILIPEPPER CAMPUS

HERE HE IS! BACK AGAIN FOR ANOTHE GREAT WINTER DRIVING ARTS SEMINA LAST YEAR'S BEST-KNOWN HEAT PROSTI VICTIM... YOUR ANTI-FREEZES' UNC OLD STUDDED TIRE HIMSELF... THE POET LAUREATE OF THE GO-IN-THE SNOW ARCHIPELAGO...

Shand of the Nort

BUT YOU COULDN'T BE CORRECTER, HECTOR, SO WITH NO MORE ADO, LET ME SAY TO YOU THAT...

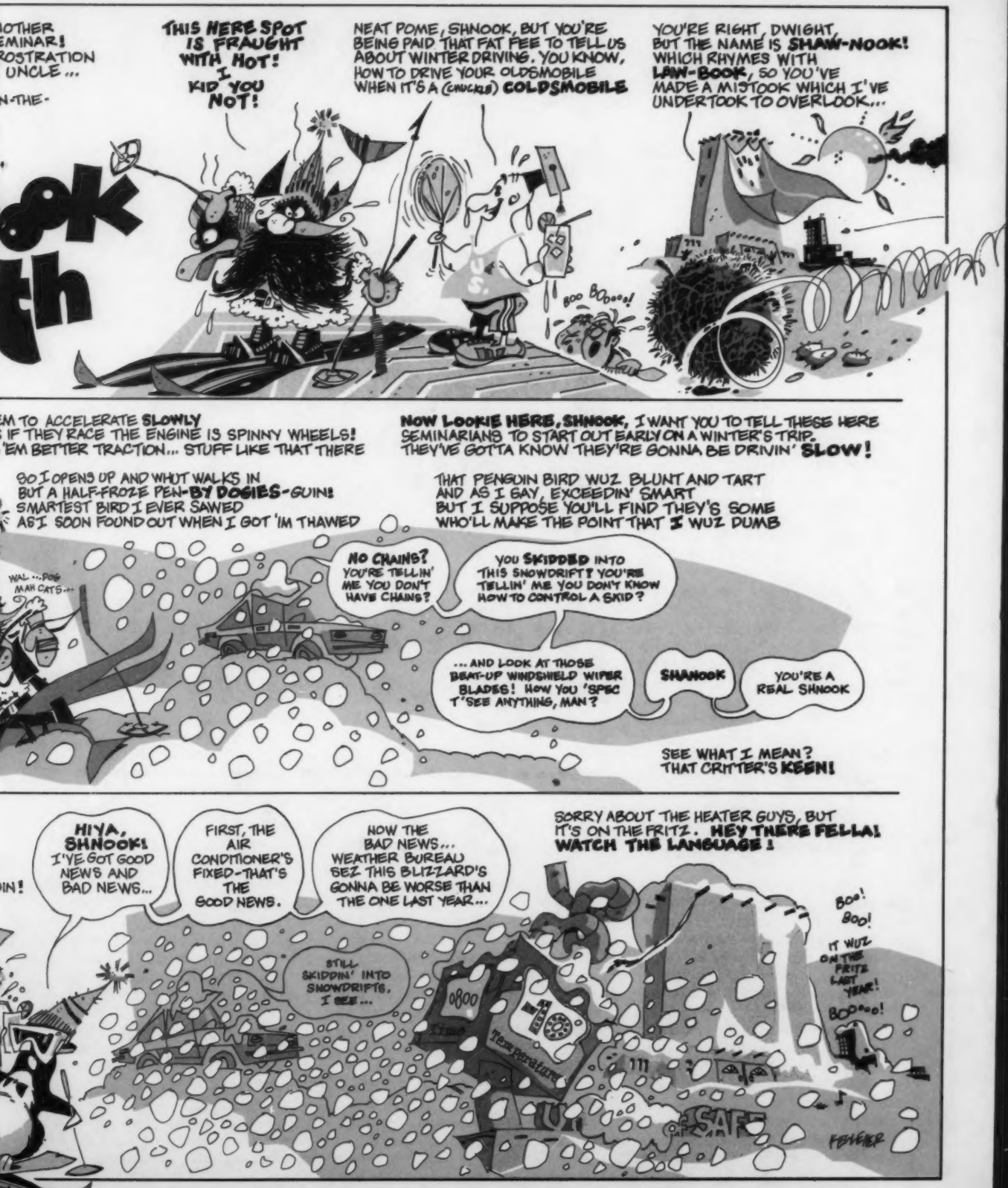
ONCE UPON A SNOWSTORM DREARY WHILE I PONDERED, WEAK AND WEARY, OVER A DOG-EARED COPY OF DRIVER MAGAZINE

HOLD ON, SHNOOK! THESE FOLKS WANT YOU TO TELL THEM TO FROM A START ON SLICK STREETS BECAUSE ALL THAT HAPPENS IF T AND THAT THE DEEPER, THICKER TREADS ON SNOW TIRES GIVES 'EM B

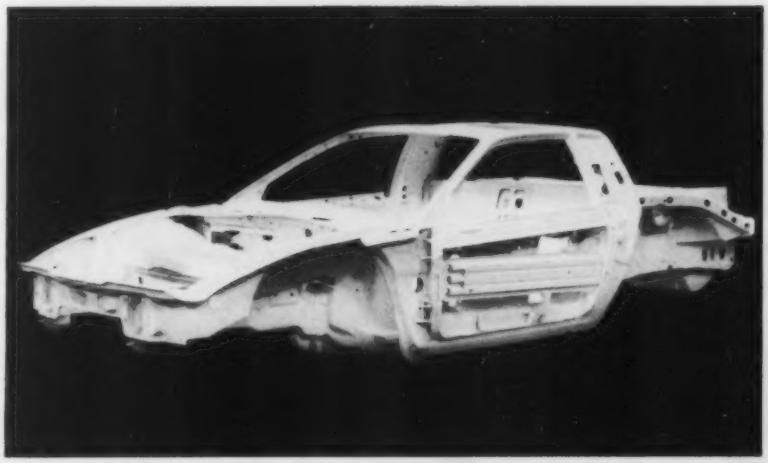
ALL AT ONCE I HEARD A CRASHING SOMETHING COLD OUT THERE WUZ TRASHING TRASHING MY OLD LIMOUSINE

THAT'S ALL VERY WELL, SHNOOK, BUT WHEN WILL YOU TELL THESE FINE, FRAZZLED FOLKS TO CHECK OUT THE EXHAUST SYSTEM OF THEIR CAR? IF ANYTHING IS RUSTY OR LEAKS - THEN REPLACE IT! A LEAKY EXHAUST SYSTEM CAN VERY WELL PUMP YOUR CAR FULL OF CARBON MONOXIDE AND THAT'S POISON, MAN!

Time
10
Temperature
University of SAFE
ARROYO CHILIPEPPER CAMPUS
IF'N YOU HAD HAIR YOU'D USE PEROXIDE AND I'D HAVE A RHYME FER CARBON MONOXIDE
LOOKIE! THAR HE COMES AGIN! THAT STUCK-UP PEN-BY DOGIES- GUIN!


OTHER EMINAR! ROSTRATION UNCLE ...
N-THE-
ook th
THIS HERE SPOT IS FRAUGHT WITH HOT! I KID YOU NOT!
NEAT POME, SHNOOK, BUT YOU'RE BEING PAID THAT FAT FEE TO TELL US ABOUT WINTER DRIVING. YOU KNOW, HOW TO DRIVE YOUR OLDSMOBILE WHEN IT'S A (CHUCKLE) COLDSMOBILE
YOU'RE RIGHT, DWIGHT, BUT THE NAME IS SHAW-NOOK! WHICH RHYMES WITH LAW-BOOK, SO YOU'VE MADE A MISTOOK WHICH I'VE UNDERTOOK TO OVERLOOK...
BOO BOO...!
EM TO ACCELERATE SLOWLY IF THEY RACE THE ENGINE IS SPINNY WHEELS! 'EM BETTER TRACTION... STUFF LIKE THAT THERE
NOW LOOKIE HERE, SHNOOK, I WANT YOU TO TELL THESE HERE SEMINARIANS TO START OUT EARLY ON A WINTER'S TRIP. THEY'VE GOTTA KNOW THEY'RE GONNA BE DRIVIN' SLOW!
SO I OPENS UP AND WHUT WALKS IN BUT A HALF-FROZE PEN-BY DOGIES-GUIN! SMARTEST BIRD I EVER SAWED AS I SOON FOUND OUT WHEN I GOT 'IM THAWED
THAT PENGUIN BIRD WUZ BLUNT AND TART AND AS I SAY, EXCEEDIN' SMART BUT I SUPPOSE YOU'LL FIND THEY'S SOME WHO'LL MAKE THE POINT THAT I WUZ DUMB
WAL ...DOG MAN CATS...
NO CHAINS? YOU'RE TELLIN' ME YOU DON'T HAVE CHAINS?
YOU SKIDDED INTO THIS SNOWDRIFT? YOU'RE TELLIN' ME YOU DON'T KNOW HOW TO CONTROL A SKID?
...AND LOOK AT THOSE BEAT-UP WINDSHIELD WIPER BLADES! HOW YOU 'SPEC T'SEE ANYTHING, MAN?
SHNOOK
YOU'RE A REAL SHNOOK
SEE WHAT I MEAN? THAT CRITTER'S KEEN!
IN!
HIYA, SHNOOK! I'VE GOT GOOD NEWS AND BAD NEWS...
FIRST, THE AIR CONDITIONER'S FIXED-THAT'S THE GOOD NEWS.
NOW THE BAD NEWS... WEATHER BUREAU SEZ THIS BLIZZARD'S GONNA BE WORSE THAN THE ONE LAST YEAR...
STILL SKIDDIN' INTO SNOWDRIFTS, I SEE...
SORRY ABOUT THE HEATER GUYS, BUT IT'S ON THE FRITZ. HEY THERE FELLA! WATCH THE LANGUAGE!
BOO! BOO!
IT WUZ ON THE FRITZ LAST YEAR!
BOO...!
0800
Time
10
Temperature
SAFE
FEIFFER

Plastic Cars



The space frame is the structural framework of the new Fiero and can be compared to the roll cage of a car, surrounding the passengers within the steel framework.

Mention plastic cars to some people and they almost panic. "A plastic car! You've got to be kidding. If you had an accident in one it would shatter into a million pieces. 'All the King's horses and all the King's men couldn't put it back together again.' Worse, it might be like a broken egg: There'd be no reason to put it back together because the yolk would be broken, except that the yolk for a plastic car is the driver!"

While that type of thinking might be valid for some custom and conversion vehicles, major manufacturers approach building plastic cars focusing on occupant safety.

Such is the case with Pontiac's all-new, two-seat Fiero. A close look at the Fiero shows that the term "plastic" refers to the exterior body panels only. Under the corrosion-free, molded compound "Endurflex" skin is a driveable chassis. In fact, at one point in the manufacturing process the car is started and driven off the end of an assembly line without body panels or interior trim.

The basis of the driveable chassis is the space frame. It's the structural framework of the car which consists of the sheet metal front compartment subassembly, the floor pan, the rear or engine compartment and the body sides, roof and doors. There are more than 270 separate stampings in the space frame assembly that are welded together.

Fiero's space frame can be likened to the roll cage of a race car. High strength steels are used extensively for weight-strength efficiency with the frame providing total structural capability. The passenger compartment is completely surrounded and protected by this steel framework.

Following assembly, Fiero space frames are machined in a mammoth 2½-story machine that precisely mills and drills 39 mounting pads that locate and support the "plastic" exterior body panels. After the mill and drill procedure, the complete space frame is Cathodic Elpo Uniprime dipped and is never again pierced or machined which provides greater corrosion protection. For additional corrosion protection, special galvanized metals are used in critical locations.

The plastic body panels are made from two basic types of reinforced composition. SMC — sheet molded compound — is used for large stiff surface panels such as hood, roof, rear upper quarter and rear deck lid. Meanwhile, reinforced reaction injection molded (RRIM) urethene is used in the high vulnerability areas such as doors, fenders, and front and rear fascias. These more flexible "friendly" panels will bend and snap back on minor impact to help reduce dents and paint damage.

Rocker panels on Fiero are made from highly chip and dent resistant Thermo Plastic Olefin compound.

If damaged, the body panels can be repaired using techniques similar to those used to repair Firebird fascias. Painting of damaged panels can be done with panels either on or off the car. When the easy-to-remove body panels are taken off the car, many mechanical components, including wiring, are exposed for easy serviceability.

Should the space frame become damaged, the structural components can be replaced and rewelded into correct dimensional tolerances without affecting the cosmetics of the body panels.

So you can see that plastic cars don't have to be as fragile as eggs and they can provide passengers with as much protection as any steel vehicle.

SEATBELTS SAVE LIVES

The few seconds it took to buckle-up the other day saved SSgt. Gary Cramer and wife, Cindy, much grief as their car was totaled in an accident.

Leaving the Tinker AFB, Okla. bank, Sergeant Cramer, who works in the 3rd Combat Communications Group, was waiting to turn onto a four-lane street. A friendly motorist motioned for him to move in front of her. "Apparently as I pulled into the road my front end stuck too far into the center lane. A speeding 1977 Oldsmobile hit my Omega in the left front corner," said Sergeant Cramer.

"The impact immediately spun my car more than 15 feet sideways. We thank the Lord that we were buckled-up," he said.

If it had not been for the seatbelts holding Sergeant Cramer and Cindy in place, they would surely have been injured. "If we hadn't buckled-up before we left, Cindy would have hit the side window and door post. I would have been thrown around in the car, possibly injuring Cindy who is five months pregnant," the sergeant said.

Unfortunately, the passenger in the other automobile, the driver's 86-year-old grandmother, was thrown into the windshield. The driver received a few minor cuts and bruises. Neither of them were wearing seatbelts.

Safe driving habits often are learned from parents and the people who teach others to drive. Sergeant Cramer credits his father with teaching him the value of seatbelts and has worn them as long as he can remember.

According to Sergeant Cramer, "It only takes a few minutes to buckle-up, but it's well worth the effort. My wife wasn't convinced before the accident. However, she is a firm believer in wearing seatbelts now. We already have a child safety seat and will certainly use it."

Sergeant Cramer examines his automobile after the accident and says, "sure am glad that my wife and I were safely buckled-up." (USAF photo by SSgt. Alan Dockery)

tteecc!h!h double tech with tsgt ron lathrop

COMMENT: I have what seems to be an unsolvable problem: when driving at night with the headlights on and I find the need to apply the brakes, the lights all dim momentarily. Sitting at an idle I have a steady discharge of about two amps.

I have set the proper idle speed, replaced the battery, the alternator, the voltage regulator and even the dimmer switch with no luck. No one seems to know what the problem is — please help!

REPLY: With all that you've done so far I'm sure the drive belt is tight and not too worn. Have you checked the brake light wiring including grounds? There's also the possibility of a defective ammeter. However, there's a more than even chance that you have a general electrical system wiring problem. Start by checking for loose or corroded connections especially on the battery cables. Don't forget the ground strap.

If, after completely checking the wiring, you still have the problem, look closer at the alternator. Recheck the connections. If the condition continues, disassemble the alternator and clean the foreign matter from the inside connections. When reassembling the unit add a flat washer over the black stator terminal insulator prior to installing the terminal nut.

There is also the remote possibility that the vacuum operation of your power brakes is affecting your ignition timing advance. Check the vacuum lines on the power brake unit as well as those to the distributor. Make sure that the lines are all in good condition and attached properly. One vacuum line attached to the wrong source and the whole system is affected.

COMMENT: While driving my 1980 front-wheel-drive compact with the air conditioning on, my brakes are not as effective as when the air conditioner is not on. As a matter of fact, it is impossible to make an "emergency stop." Even at very low speeds (10 mph) the car won't stop within a distance of eight feet! The engine does increase in rpm while the air conditioner is in use but the increase in rpm does not seem to be excessive.

This problem has confounded the people at the Exchange service station brake shop and the service manager at the local authorized dealer. Do you have any ideas?

REPLY: Well, you didn't say what work had already been tried or what engine/transmission combination your car is, but here goes anyway.

It really sounds like you have a malfunctioning power unit. Because the air conditioning mode selector control lever makes use of vacuum supply to operate various inlets, diverters and doors, it may well be the source of the malfunction.

Check all the vacuum lines to make sure they're in good condition and attached properly. (Sounds like the previous answer, doesn't it?) Also check to make sure the lines are attached to the proper locations. Then check the vacuum accumulator (tank, reservoir) for leaks. A leak here could mean there isn't enough vacuum to operate more than one system at a time.

Also be sure that the vacuum lines are all the right ones. Get one with a flow restrictor in it hooked to the wrong system and you'll have big problems.

If vacuum isn't the problem, then it probably is the power unit itself.

Again, as you didn't say what work had already been attempted there are numerous other problems that could be contributing to this situation. The discs could be glazed, the pads worn or glazed, or the pads could be the wrong type.

Without getting too technical, air conditioners are really heat exchangers, and all that heat is dumped off at the front of the car. Add this heat to that of the engine plus all that the brakes generate just doing their job and it is very possible to get fade — loss of braking effectiveness because of excessive heat.

Brake fade becomes a real problem when — to save a few dollars — regular pads are used instead of the semi-metallic ones called for by the manufacturer, i.e. the wrong pads.

You also didn't say whether the air conditioning was factory installed or add-on. On your vehicle the factory is supposed to replace several of the vacuum hoses with pipe because they are routed near areas that get extra hot when equipped with air conditioning. Think of the problem when you add after-market air conditioning without changing the proper hoses to pipe.

By the way, it takes the average car nine feet to stop at 10 mph. That's nine feet after the normal 11 feet it takes most people to react in. That's 20 feet total at only 10 mph. There's no such thing as stopping on a dime!

COMMENT: Help! After just 24,000 miles, the rear tires on my 1982 front-wheel-drive car are ruined. They have worn terribly in a "cupping" fashion, that is, in random spots around the tire.

The tire man says it's the rear end of the car, but the authorized car dealer's mechanic has checked it thoroughly (shocks, springs, joints, alignment, etc.) and says everything is A-OK. He claims the tires used to be on the front from the way they look (they never have been).

My front tires look fine, like they should last 40,000 miles or more.

I can't afford new steel-belted radials every 20,000 miles. What could be the problem.

REPLY: Cheap tires. Notice I didn't say inexpensive tires, I said cheap tires.

As badly worn as you say the tires were, I'm really surprised you didn't feel them earlier. They must have been terribly out of round and just beat themselves to death. Actually, I should back off from the "cheap tires" statement just a little and say that the wheels they are mounted on could also be out of round. But my vote is still against the tires.

Figures provided by one leading tire manufacturer indicate that good radials can last slightly more than 30,000 miles on the front of a front-wheel-drive car when properly maintained.

The life of the same tires on the rear wheels of the same vehicle is put at nearly 100,000 miles.

Of course, if you run up and down mountains playing Ronnie Road Racer, even the best care is only going to get you 12,500 miles on the fronts and 25,000 on the rears.

COMMENT: My son was driving our new used car home from a weekend in the mountains recently. After a while I asked him to start slowing down and he said he had been trying but the brakes just weren't that good.

I checked the pads and they look good and thick. The discs also look good. What's wrong?

This sub-compact, rear-wheel-drive car had more than 50,000 miles when I bought it. It had been used as a delivery vehicle in a major city before I got it for the kids.

REPLY: It's a good bet that the pads aren't the semi-metallic ones called for by the manufacturer and had faded completely under the hard mountain road use.

When replacing the pads with the proper type, double check the disc thickness. If they are worn below allowed thickness they won't handle heat well and will contribute to fade.

City/freeway driving like the car probably did before you bought it is the hardest on brakes there is. Even harder than most mountain driving. Under hard use, the brake fluid should also be changed every 30,000 miles or so, as it breaks down and can be affected by heat.

COMMENT: I opened the hood on my car the other night and got a real electric show. The spark plug wires appeared surrounded by a reddish or violet glow. It looked like the gleam from a neon sign outside my favorite watering spot. Is this serious?

REPLY: It looks a lot more serious than it actually is. This strange effect is known as corona discharge and it occurs when the humidity is high and the barometric pressure low. As you noticed, corona is what causes neon tubes to light up.

What happens is that the high voltage in the ignition system develops a strong enough electrostatic field around the plug wires to break down (ionize) the air surrounding waves.

It is essentially harmless to the plug wires and doesn't affect the ignition system. And it makes no difference who manufactures the wire or how thick the insulation is. However, worn out plugs or those with gaps wider than recommended raise the voltage required to fire them. This increases the likelihood of corona discharge.

While it may look shocking, this electrical show does no harm.

EDITOR'S NOTE: If you have a general interest automotive comment that you would like a reply to and feel others could use the information too, send it to:

Double Tech
DRIVER Magazine
HQ AFISC/SEDD
Norton AFB, CA 92409

weakest link

There are right and wrong ways to do just about everything. For example, one of the wrong ways to maintain a motorcycle's drive chain is to ignore it.

The results of such neglect are very predictable: A beautiful weekend trip will be ruined when the chain comes off or is broken in the middle of nowhere. There you are out in the desert, back in the woods or just miles away from any form of civilization with a bike that won't go. Or you could be stuck on foot in traffic knowing the boss is going to hang you for being late to work again.

Those are the mild results. A broken chain can also do a lot of damage to sprockets and even the engine-transmission case. Worse, a broken or tossed chain is a real threat to feet and ankles.

Considering its working conditions in water, dirt, grit, etc., a drive chain's job is tough enough without being totally ignored. However, you can make life easier for your cycle's drive chain with

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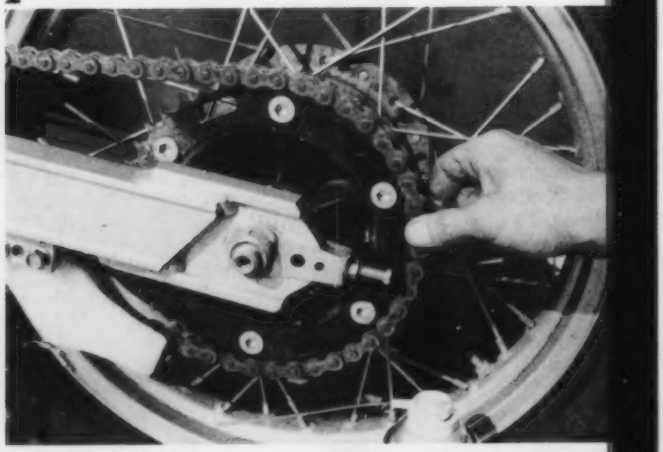


If you can see most of a sprocket tooth when pulling on one chain link, remove the drive chain and measure it for wear.

(left)
Every job has its proper tools. For motorcycle drive chain maintenance the minimum tool kit includes proper size wrenches, a good lubricant and a shop or owner's manual.

a regular maintenance program. The important thing to remember is that just about any type of periodic chain care is better than none at all.

As we said at the top of this story, there's more than one right and one wrong way to do things. Another one of the wrong ways to maintain a motorcycle drive chain is known by those who attempt it as the "rag" method. In emergency rooms it has become known as the "amputation" procedure.

The mechanic/victim attempts to service the motorcycle by holding an oily rag on the drive chain while the machine is running in gear. Of course the chain grabs the rag with such force and speed that it also pulls the holder's hand into the sprocket, removing a finger or two or more.

OK, enough of how not to do something. Drive chain maintenance actually begins with having the right tools. Most motorcycle tool kits contain the tools needed to get the job done. This kit should always be kept with the bike since some chain adjustments may not wait until you get back home.

If you're going to build your own chain maintenance tool kit, start with some open-end wrenches in the sizes that fit the rear wheel axle nut, chain adjuster bolt and lock nut, and brake anchor plate nut. Make sure of the sizes before buying the wrenches.

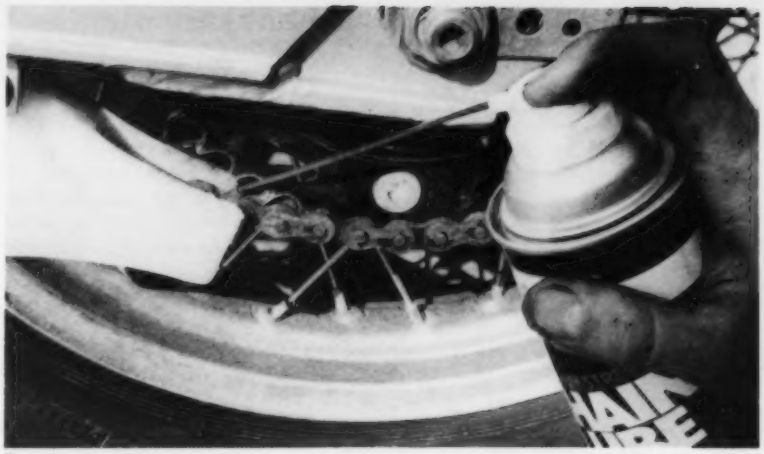
Another handy tool is a 12- to 15-foot section of string. This will be used to determine correct wheel alignment and maximum chain tension. The string can also be used to secure tools when they're carried on the motorcycle.

If you don't have a friend around to lend an extra pair of hands, you'll also want to get a motorcycle tiedown strap. Clean rags and your favorite brand of chain lubricant should finish out the list of tools and supplies.

It's also a very good idea to have your owner's manual handy whenever you work on the motorcycle. The appropriate workshop manual for your machine helps with this and all work you do yourself. Most dealers have the right manuals available.

Before investing in a new chain or spending time working on an old one, check the sprockets for damage and excessive wear. Be sure to check both the countershaft (gearbox) sprocket and the larger rear wheel sprocket.

Some slight, even, cupping of the sprocket teeth is inevitable, but severe cupping means it's time for new sprockets. If you don't replace a worn sprocket it will ruin the chain no matter how new and expensive it is.



3 **The secret** to long chain life is lubrication applied properly at regular intervals.

To inspect the drive chain, simply grasp one link at the rear of the wheel sprocket and pull on it with your thumb and forefinger. If the link is loose enough to expose most of one sprocket tooth, you should remove the chain and measure it for wear.

Before removing the chain, check to make sure that the countershaft sprocket is easy to get at. If it's not easy to reach, follow this tip and save yourself a lot of trouble when it's time to reinstall the chain.

First, get a two- or three-foot section of old chain (with the correct pitch and width) and connect it to the end of the chain being removed from the bike. With the gearbox in neutral, carefully draw the dummy section of chain around the countershaft and leave it until the original chain is reinstalled.

Now disconnect the original chain and remove it.

Chain wear is usually the elongation of the rollers around the pivot pins and shows as stretching. Once the chain has stretched more than two percent it should be replaced.

To measure the stretch, place the chain on a flat surface and measure it from tip to tip. First measure it fully compressed and then again fully stretched. Replace any chain that measures two percent longer stretched than it does compressed.

The maximum stretch length is the compressed length of the chain times 1.02. For example, if your chain measured 60 inches when compressed, then the maximum allowable stretched length would be about 61¼ inches (60 x 1.02 = 61.2).

A chain that has stretched more than two percent will cause the sprockets to wear faster and will eventually break. Remember that when a chain breaks it can do expensive damage to sprockets, the engine/transmission and riders' legs.

The secret to longer chain life is lubrication. Use one of the aerosol penetrating lubricants often, unless your machine is equipped with a "self-lubricating" chain. Then you should follow your owner's manual instructions.

To lubricate the chain, place the cycle on its centerstand with the engine off and the gearbox in neutral. This will allow you to spin the rear wheel by hand. Spray each side of the chain on the inside between the link plates. Then lubricate the rollers on the inside (the part of the chain that actually touches the teeth).

It's best to lubricate the chain after a ride so that the lubricant can have time to penetrate the roller pivots. If you lubricate the chain just before a ride, you'll fling oil everywhere and may well waste more of the fluid than do good. Besides, oil on the rear wheel can be very

continued

continued

dangerous and cause you to spill the bike.

To clean the drive chain most manufacturers recommend removing the chain and soaking it in a pan of cleaning solvent for at least half an hour. Then scrub the roller and side plates with a stiff brush before rinsing the chain in clean solvent to carry away loosened grit. The chain is then hung up and allowed to dry.

Then the chain should be relubricated with a good grade of chain lubricant (carefully following the lubricant manufacturer's instructions). The chain is then reinstalled using a new master link clip. When doing this make sure the master link retaining clip is pointing in the direction of forward chain travel.

As with spray lubricants, allow the lubricant a few minutes to soak into the drive chain before riding the bike.

Other mechanics say that removing all the exterior crud from the chain is OK, but that the soaking in solvent usually dissolves the protective lubricant that has been faithfully applied. This, in turn, allows the abrasive particles to enter the inside of the chain rollers. This school of thought contends that while the chain looks cleaner, it is actually dirtier inside. They claim that once the abrasive particles enter the bearings surfaces it's almost impossible to remove them.

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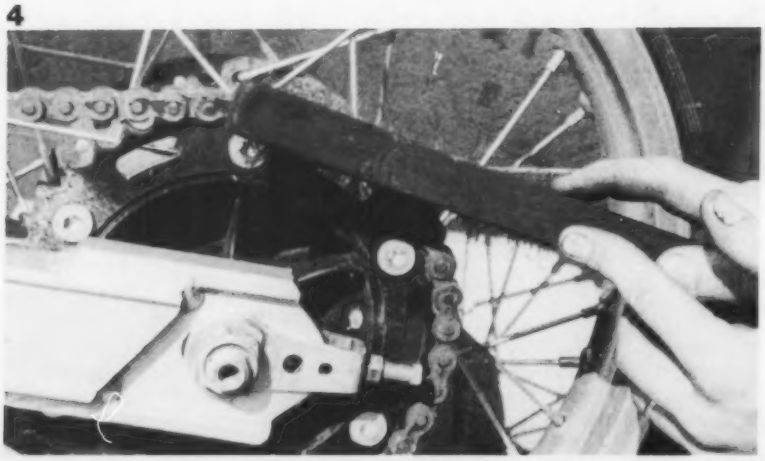

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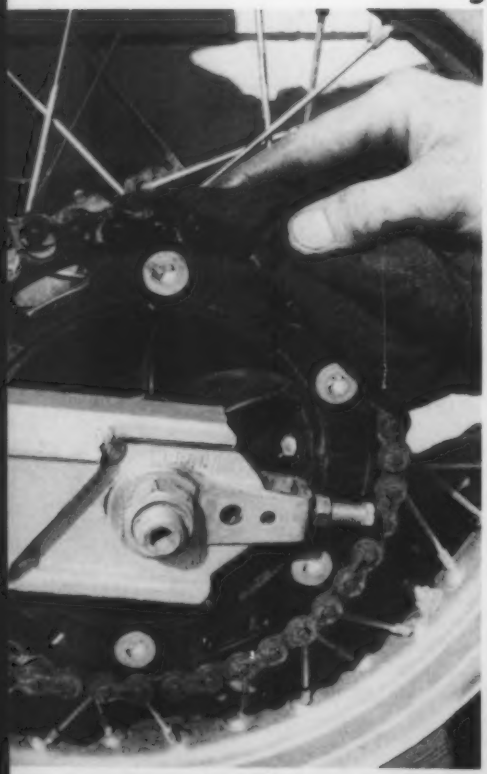

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(left and below)
After brushing off the dirt (pic #4), wipe it clean with an oil-dampened cloth (pic #5) and apply a spray-on lubricant (pic #6).

Their recommendations for chain cleaning begin with removing the large dirt deposits with a brush. Then wipe the chain with a clean oil-dampened cloth. (Notice that this is done with the engine off and the transmission in neutral.) The job is finished with a liberal application of spray-on lubricant.

While this process is easier than the "remove and soak" process, it must be done more often.

The periodic application of lubricant is supposed to build up a protective layer and prevent most of the dirt and crud from entering the insides of the chain, thus prolonging chain life.

Another element of longer chain life is proper wheel alignment. Of course, proper wheel alignment also promotes longer sprocket life, better tire wear, and good tracking and handling qualities as well as safety.

Many motorcycles have index or "hash" marks to facilitate chain and rear wheel alignment. These marks are usually located behind the rear axle as part of the chain adjuster assembly. In theory, correct wheel alignment occurs when both left and right adjusters are set on equal alignment marks. Of course, this isn't always true and can result in gross misalignment of the rear wheel.

To check the rear wheel alignment, place the motorcycle on its centerstand with the front wheel pointed straight ahead. Using the 12- to 15-foot length of string, tie one end onto a front wheel spoke near the ground and towards the front of the tire. Pull the string around the front of the tire and toward the rear, making sure the front wheel stays pointed straight ahead.

Kneel close to the ground several feet behind the bike and pull gently on the string so that it is resting along the sidewalls of both front and rear tires. Adjust the rear tire so that it is evenly framed in your line of sight with the front wheel by the string. Do the same sighting with the string on the opposite side of the wheels as a double-check.

How often you adjust your chain may depend on the type of riding you do. Many touring riders travel hundreds of miles daily without adjusting their chains, while motocross racers adjust theirs between every heat. For the average street rider, once-a-week adjustments should do the trick.

Frequent small adjustments are far better than a few large takeups. If there's any question, do the adjustment.

Because the swing arm suspension found on most motorcycles varies chain tension between its extremes, the center of the swing arm arc must be located before proper chain tension can be determined. The chain will be tightest at the center-point of the arc and looser at each of the extremes.

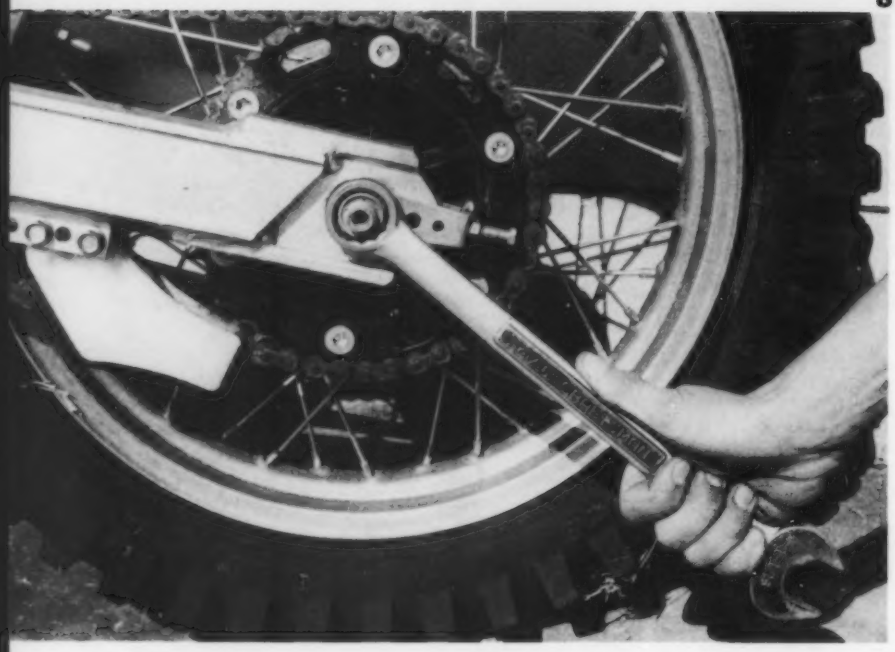
It is important to check the chain tension at its tightest point to avoid overtightening and stretching it. The chain will be at its tightest point when the centers of the rear axle, swing arm pivot and countershaft sprocket are in line. You can estimate where this point is by holding a piece of string across the

continued

7

Free play is the total up and down movement of the chain at its tightest point.

8



centers of the countershaft sprocket and swing arm pivot and extending it rearward in a straight line. This will indicate where the axle should be to achieve the most chain tension.

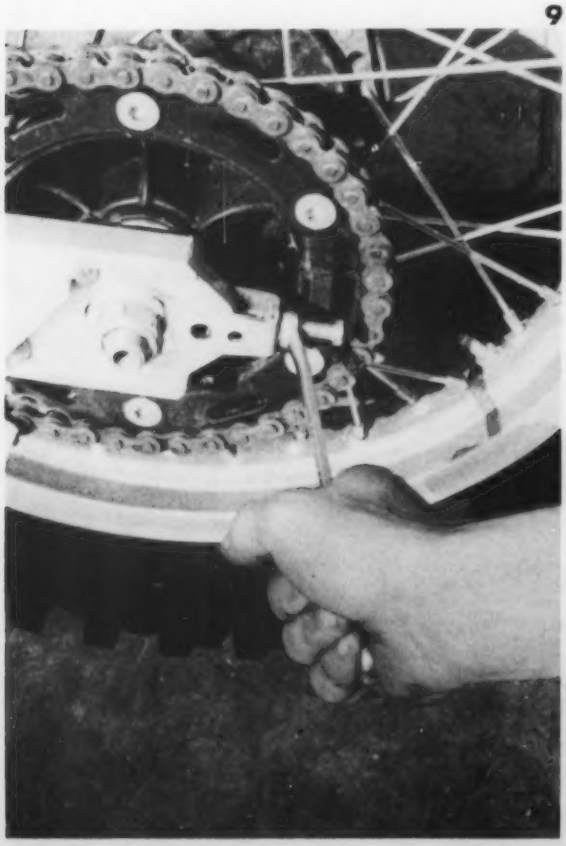
In order to actually find that tightest point you'll probably have to compress the rear suspension. This is where that friend with the extra pair of hands comes in handy. Otherwise you'll have to use the motorcycle tie-down strap.

If you're adjusting a worn chain, you'll also want to check its tension at several points. Some will be tighter than others. Again, the actual adjustment should be done when the chain is at its tightest.

Once the suspension is compressed to the chain's tightest point, you can check the drive chain's "free play." Free play is the total up and down movement of the chain. For most street bikes one-half inch

(above and below)
To adjust the chain you have to loosen the adjuster locknuts several turns (pic #9) and turn the adjusters on either side of the rear axle equally (pic #10).

9



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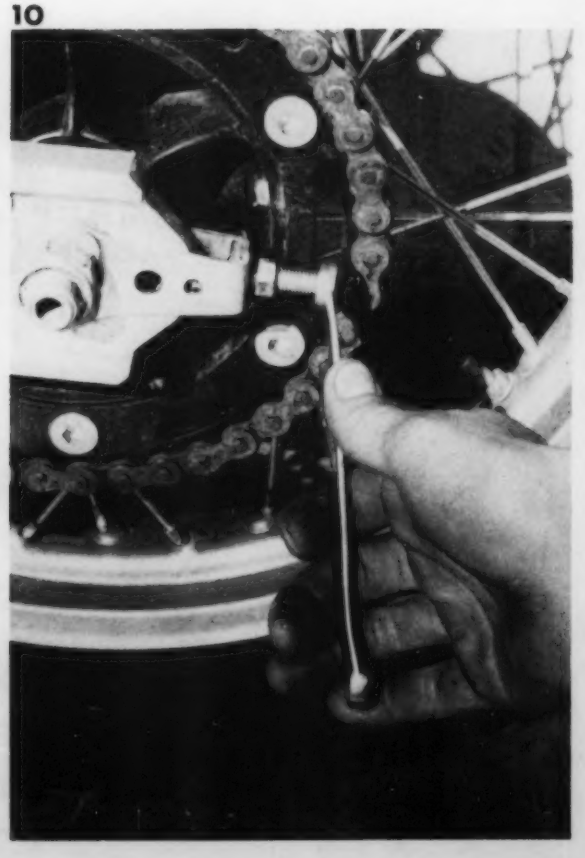


of free play is usually recommended, while dirt bikes often need three-quarters of an inch.

To adjust the chain, you may have to first loosen the brake cable or rod adjuster found near the rear brake arm. You may also have to loosen the brake backing plate anchor bolt to prevent damaging the plate. The backing plate anchor is usually an arm attached to the swing arm which prevents the backing plate from turning when the brake is applied.

With the adjuster locknuts loosened several turns, loosen the rear axle nut. Now bump the wheel to firmly set it against the adjuster stops. Then turn the adjuster bolts located at each axle end in or out equally until the adjustment is correct.

By leaving the top of each adjuster bolt in a horizontal position you can count an equal number of turns for each adjuster bolt to maintain proper wheel alignment.

11

"Hash" marks help keep the rear axle in alignment when making adjustments.

12

Notice how the master link retaining clip is pointing in the direction of forward chain travel.

Check the drive chain's free play to assure proper tension. Also sight along the top of the chain from the rear of the bike to check wheel, chain and sprocket alignment. There shouldn't be any bends in the chain. Using the string, check the rear wheel again for proper alignment.

Now recheck the vertical play, turning the adjuster bolts equally to get it right. Finally, tighten the locknuts after you've set the proper alignment.

Tighten the axle nut carefully, pulling the wrench to the front of the bike. This helps to seat the axle against the tops and is less likely to disturb your wheel alignment and chain tension adjustments.

Recheck the rear wheel alignment with your string as it is very easy to disturb this adjustment on the previous step. So it's better to catch it now than when you're wobbling through a tight corner on the highway.

Before retightening the backing plate anchor bolt,you should push the bike forward and slam on the rear brake. Hold the brake on until the backing plate anchor bolt is tightened. This will require the help of a friend but it insures that components seat properly and that the rear brake action and feel isn't disturbed.

Finally, tighten and adjust the rear brake cable or rod for the correct amount of free travel at the brake pedal (usually one-half inch or less).

These steps may seem complicated and drawn out, but if you read through them one more time you'll get a better idea of the job before tackling it.

DRIVER thanks the service staff at Dale's Modern Cycle, San Bernardino, Calif., for their assistance in the preparation of this article.

55 SPEED LIMIT STUDY ANNOUNCED

The Department of Transportation has announced that the National Research Council of the National Academy of Sciences has initiated a comprehensive study of the benefits and costs of the 55 mile-per-hour national maximum speed limit.

A 19-member panel has been selected to assess the safety, energy and economic effects of the 55-mph speed limit law. The Academy panel will deliver a study report containing conclusions and recommendations to the Secretary of Transportation and the Congress in August 1984.

The 55-mph speed limit was initially established on Jan. 1, 1974 as a temporary energy conservation measure during a period of severe interruption in the domestic oil supply. During the first year of the 55-mph law, fatalities on the nation's highways declined dramatically with some 9,000 fewer deaths than the previous year. The law was made permanent in January 1975.

One major focus of the Academy study will be to assess the extent to which the 55-mph speed limit contributed to the decline in motor vehicle fatalities, and to estimate the likely contribution of the 55-mph speed limit in reducing fatalities now.

NHTSA PROPOSES CHANGES IN AUTO LIGHTING RULES TO INCREASE COMPATIBILITY WITH EUROPEAN STANDARDS

The National Highway Traffic Safety Administration (NHTSA) has proposed changes in automobile lighting performance requirements that would make them more compatible with European standards, thereby lifting some unnecessary barriers to international trade.

NHTSA Deputy Administrator Diane K. Steed said, "Harmonization of American and European standards has been under discussion for several years. Compatibility of standards helps both consumers and manufacturers because they don't have to pay for costly differences in regulatory requirements when there is no added safety benefit.

"Savings on testing and administrative procedures help to lower the cost to the consumer and increase the manufacturer's ability to compete in the open market," Steed said.

NHTSA has requested comments on the proposed changes in Federal Motor Vehicle Safety Standard No. 108, Lamps, Reflective Devices and Associated Equipment, which include:

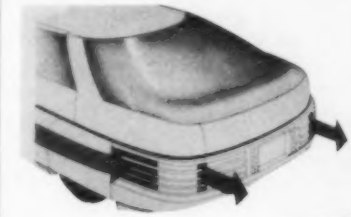
- Extension of the range of allowable brightness in yellow rear turn signals to facilitate the use of common bulbs for these lights in both U.S. and European cars;
- Changes in photometric test pattern so that similar procedures may be used to test the intensity of stop, tail, turn signal and parking lamps;
- Adoption of the latest Society of Automotive Engineer standard for license plate lamps, to include a specific point of measurement between lamps, plates and holder; and
- Changing the minimum permitted mounting heights of headlamps from 24 inches to 22 inches, measured from road surface to the center of the lamp, to provide compatability with European lamp levels.

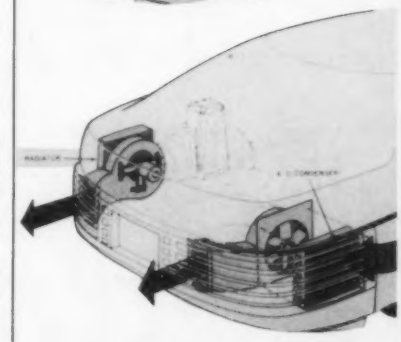
AUTO GRILLES MAY DISAPPEAR

Automobile grilles which help protect radiators and provide good-looking, distinctive front ends may be eliminated from cars in the next several years to improve aerodynamics and increase fuel economy, reports the Automotive Information Council. Some of the newer, sportier models already are near this appearance.

One design executive said: "If you could close up and do away with the grille of the vehicle entirely, that really enhances the CD (coefficient of drag). I think we're going to see a lot of work in that area with air dams that get the air to flow around the vehicle instead of under it."

Another approach is to have the air come in under the bumper and then into the engine compartment for cooling.





A futuristic concept is to have the radiator housed in the rear with the air intakes behind the rear-wheel wells. Power fans would draw air into the vents and exhaust it out the rear, which also would help reduce negative air turbulance in that area of the vehicle.

Reduction of the CD now is a prime target for auto engineers and designers in an effort to make the car more "slippery" to improve fuel economy. The auto companies are spending lots of money to make these future designs feasible and realistic, and they are making extensive use of aircraft-type air tunnels to achieve these goals.

If grilles are eliminated, they would be replaced by plastic "noses" which flow into the vehicle design and provide a flexible surface which forgives dings and dents. They also would be color-matched to the vehicle's exterior color.

Keep 'em MOVING

By Sgt. Nolan Wells
24th Marine Amphibious Unit
Beirut, Lebanon

24th Marine Amphibious Unit mechanic Lance Corporal Theodore Burt taps on a universal joint to get it into place.
(USMC photo by Sgt. Nolan Wells)

To keep the family car operating, the average backyard mechanic often times finds himself spending more evenings and weekends on his back than he cares to imagine.

Lance Corporal Theodore Burt, the only mechanic assigned to the 24th Marine Amphibious Unit headquarters, has an even more difficult job. He is responsible for keeping 15 M151 jeeps running on the irregular roads of Beirut every day.

"Universal joint failures have been the biggest problem with the jeeps," Burt says. "Since arriving here in June, I have replaced about 25 of them."

Most frustrating is, according to Burt, "Nothing can be done about it."

It seems the U-joints cannot handle the abrupt bouncing and jarring the jeeps are subjected to while operating on the war-torn roads of the city.

"Under conditions such as those in the U.S.," Burt says, "a jeep may need one U-joint replaced each year. The roads around here are just too hard on them."

Another major challenge the 21-year-old mechanic encounters is the dust. The long dry summer of Lebanon leaves the ground parched. Dust flies from under a person's foot with every step, and the rumble of a jeep roaring down a dirt road stirs up a thick cloud.

"The dust gets into the oil, so that it has to be changed more often," says the Waterloo, Iowa, native. "If it isn't changed regularly, serious problems with the engine could arise. That would mean more work."

Burt's status as a second echelon mechanic limits him to what he can do in repairing a jeep. However, there are few problems which he has to pass on to a higher echelon of repair.

"Most of the work I take care of myself if I can get the parts," Burt says.

"When I was at home, all I did was mechanical work with my father," he says. "I took all the classes for a mechanic I could while in high school.

"I came into the Marine Corps wanting to be an aviation mechanic," Burt says, "but I didn't have a guarantee. I had an open contract, so I could have ended up in a field I didn't like. I don't have any complaints about my job, and I like what I am doing."

Burt's day is not all mechanical work. He says there is only so much he can do with a wrench before he has to pick up a pen. Some of the parts he needs have to be ordered through the Marine Corps supply system. At times this can cause a jeep to be down for as long as a month before the parts arrive.

"If there is something wrong with the brakes, or if there is a problem which could leave you stranded someplace," the mechanic says, "the jeep is deadlined."

But Burt points out, "We haven't had too many of those." His pride reflects in the fact that he has sent only six jeeps to a higher echelon for repair, and only three are deadlined awaiting parts.

Burt credits his marked abilities here not only to prior mechanical experience and four months of schooling at Montford Point, N.C., but practical application he received at Fort Bragg, N.C.

"The road conditions there are similar to Beirut road conditions," he explains, "but they aren't quite as bad as they are here. It was good training, though, and it prepared me well."

The day is not all work and no play for the lone mechanic, but he does not forsake his responsibilities to play. Instead, he mixes play with work by showing movies to Marines of the MAU headquarters each night.

"I don't mind putting in the extra hours," he says. "Besides, it gives me a break and makes sure I have a chance to watch the movie."

Burt works in close quarters under a jeep as he tightens down one of the many universal joints he has had to change while in Beirut.
(USMC photo by Sgt. Nolan Wells)

Being the only mechanic for 15 jeeps, Burt can certainly use the break. His job is far removed from upkeep of the family car. He keeps Marines on the move as they cope with the fast-moving, ever changing situation.

Off the Pavement

A young airman received fatal injuries in an accident in Germany recently. The driver of the car in which he was riding was rounding a curve when the right front tire slipped off the pavement. After getting back on the road, the car continued left into the on-coming lanes of traffic and collided with a truck.

This type of accident occurs so frequently it is almost a classic. The driver instinctively turns and accelerates to get the tire back up on the pavement and then careens across the road before he can correct the steering.

If you find yourself with a tire off the road, slow down! Unless there are big trees or other solid objects ahead, wait until you are almost to a stop before trying to get back on the roadway. If you're in danger of hitting a fixed object head-on and cannot slow down as much as you'd like, steer left onto the road but be prepared to straighten the wheels the moment you're back on the pavement.

If this happens to you, slow down as much as possible before taking corrective action. Scratching your car on roadside bushes is much better than risking a head-on collision with other traffic.

BACKFIRE
LETTERS to the EDITOR

WHICH STATES REQUIRE LICENSES?

Your article in the August 1983 issue of DRIVER is very informative and helpful as to which states require motorcycle licenses.

I work at the safety office at Charleston AFB, S.C. and we run a National Motorcycle Safety Foundation course every month. We check drivers licenses closly to see if people are properly licensed to operate a motorcycle. For purposes of correct licensing we use the AAA Digest of Motor Laws (1983). Upon checking it against your article I found your information of North Carolina to be incorrect. The digest states that anyone licensed on Oct. 1, 1979 or after needs an endorsement on their drivers license. Mississippi also shows you can use either a drivers license or a motorcycle license.

I read your magazine every month and totally enjoy it. Keep up the good work.

Mary M. Hale
Charleston AFB, SC 29404

Our information was provided by the American Motorcyclist Association as correct on May 1, 1983.

TIRED OF HEARING

I read your article "Driver Interviews Head of RAH" in the July 1983 issue of DRIVER.

I am tired of hearing the helmet laws battered about. Studies and statistics can and are analyzed and interpreted by individuals, groups etc. to reflect what they *want* the results to reflect.

My feelings are let those who ride decide. I personally do not wear a helmet. That is my decision. I have had my share of accidents during 13 years of riding, both serious and minor. I have hit my head and face while not wearing a helmet and am still here with all of my faculties intact.

In our "free society" which I defend, I cannot see why people can't accept and respect each others opinions and views. You wear a helmet and I don't, so what! Am I harming you in any way by not wearing one? No! So leave me alone. By law I have the freedom to choose what religion I want, what kind of job I want, where I want to be buried, etc. Why then do I need the choice of wearing or not wearing a helmet made for me.

SP6 Bradley T. Scott, USA
APO NY 09757

That's all fine and well except that the rest of the citizens of this free country are left supporting your family if you go out and waste yourself riding without a helmet. And those same citizens can also get stuck footing your medical bills if you only manage to turn yourself into a vegetable instead of killing yourself. Responsibility always goes with freedom, and you are responsible to the people who care about you for not wasting your life needlessly and senselessly when a simple helmet could have saved them a lifetime of grief. Besides, regulations for all Department of Defense agencies require the wearing of a helmet while operating or riding a motorcycle on government property or on government business.

ONE SATURDAY AFTERNOON

It was a Saturday afternoon in September, 1981. I was leaving a department party at the beach. After ensuring the two toddlers were strapped into the back seat with the seat belts (the only restraint system available), Alice and I got into the front seats. Alice hooked her seat belt, but I decided not to fasten mine.

We were leaving the beach on a winding road, traveling approximately 30 miles an hour. We were into a right curve when we met two other cars (both were over the center line). I passed both vehicles by going onto the right shoulder, but a short distance ahead was a tree. I swerved the car back onto the road to try to avoid hitting the tree head on. Because of the bank of the road, I was unable to hold the car on it. The car swerved off the road and into an open field on the other side. I had it made, or so I thought. The impact into the open field caused the back tire to separate from the rim, making the car roll. After rolling three-and-a-half times it stopped on its side. I helped Alice out of her seat belt and out of the car. I knew I was hurt, but I was more worried about the two toddlers in the back seat. One child had climbed out of the seat belt after the car stopped. I was removed from the car and then passed out.

I was hospitalized for observation and possible fractures. Alice suffered a slight concussion from us bumping heads. Both toddlers were fine, except for bruises suffered from the seat belts locking them into their seats. I was released from the hospital four days later and told I had suffered a bad sprain. Six months later they discovered I had three crushed vertebrae in my neck. I was operated on and placed on limited duty for six months. I had to learn the hard way that seat belts can save lives and injuries.

RM1 Diana L. Kroptavich, USN
Point Mugu, CA 93042

LAYING DOWN THE BIKE IS A NO, NO . . .

We enjoy the articles in DRIVER magazine. For the most part, they are highly informative and good reading for all personnel within the shop. I do make it a point to browse through each new issue for pertinent information.

Since I usually commute on a motorcycle, I am particularly interested in any two-wheeled motor vehicle articles that you've written. However, there is one area of cycling that may have been overlooked. That is, how to lay your bike down in drastic emergencies. Most Air Force motorcycle operators have gone through the safety courses in order to ride their bikes on base. This includes proficiency training, safety, physical aspects of the bike and hazard avoidance. I believe instruction on the proper methods of laying your bike down (if required) should also be stressed. This is an aspect of bike riding that cannot be experienced by the novice rider, but information pertaining to proper methods can save lives.

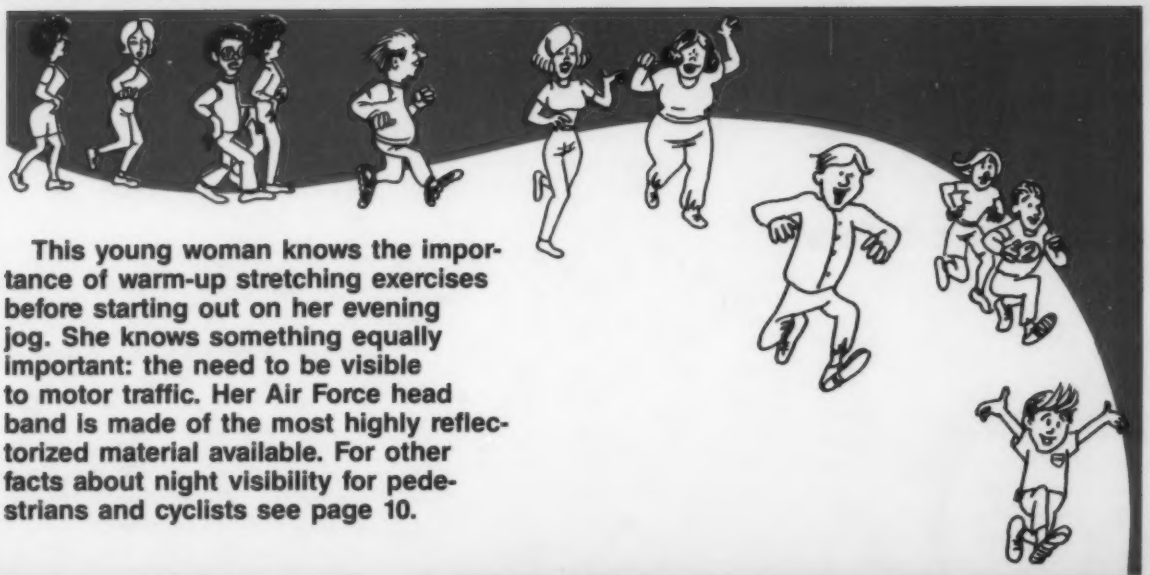
Is it possible to have articles of this type from professional bikers on the right and wrong ways of laying your bike down in emergencies?

Thanks for the interesting articles in your magazine, and keep up the good work!

MSgt. George H. Takahashi, USAF
Eglin AFB, FL 32542

Thanks for the kind words, but we want to clear up a misconception. For numerous reasons, riders are no longer taught how to lay motorcycles down. Primarily because today's bikes can stop in almost as much space as it would take to lay them down, but also because once the motorcycle has been laid down the rider has given up control and the accident has happened. Studies have shown that once a rider is taught to lay a machine down, he or she is very likely to do just that instead of executing other maneuvers that would have prevented an accident.

*U.S. GOVERNMENT PRINTING OFFICE: 1983 683—027/12



This young woman knows the importance of warm-up stretching exercises before starting out on her evening jog. She knows something equally important: the need to be visible to motor traffic. Her Air Force head band is made of the most highly reflectorized material available. For other facts about night visibility for pedestrians and cyclists see page 10.